



# SMART APNEA DETECTOR

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## ABSTRACT

The project is about people suffering from apnea in which breathing stops due to some reasons. It is the device which will directly contact with nearest hospital in case of emergency on its own through cloud. Sleep apnea is a condition where people pause while breathing in their sleep; this can be a great concern for infants and premature babies. Current monitoring systems either required physical attachment to a user or may be unreliable. This project is meant to develop a device that can accurately detect breathing through sound and issue appropriate warnings upon its cessation. This device produced is meant to be a standalone device. Through this device we can detect the abnormal behavior of the patient and ask for necessary. This equipment is cheaper than CPAP and hence everyone can will afford it. This may transform into better device and can change perspective of not only taking the matter in our hands but if involving hospitals who can provide help without delay.

**KEYWORDS:** Apnea, Heartbeat Sensor, Flex Sensor, Bluetooth Arduino.

## I. INTRODUCTION:

As a matter of fact, around 75% people are suffering from sleep disorders in which 13% are apnea cases. A device like CPAP is too expensive for people also through researches the failure rate is about 43%. Apnea detector is the simplest and the cheapest technology which uses two sensors to sense the conditions which will be analyzed by an android app which is cloud and sending data to nearest hospital and an emergency contact. This module consists of strain gauge and heartbeat sensors whose readings will be transfer to mobile through Arduino hc-06. The flex sensor and heartbeat sensors here use for reading expansion and contraction of chest and heartbeats. Through this device we can detect the abnormal behavior of the patient. This device is cheaper than CPAP and hence everyone can afford it. This may transform into better device and can change the perspective of not only taking the matter in our hand but involving hospitals who can provide help without delay.

## II. AIM AND OBJECTIVE:

To develop new enhanced and cost-effective device for people suffering from apnea. This project is a breath detection system; the particular aim of the project is to be able to detect the breathing of an infant. By being able to detect breathing you can notice when it stops and for how long, this is important due sleep apnea. Sleep apnea is a condition where people pause their breathing while sleeping. This can potentially be hazardous, especially for infant and premature babies where it is called apnea of prematurity if they are less than 37 weeks and apnea of infancy if they are older than 37 weeks. Apnea events are classified as cessation of breathing at least 20 seconds or longer. There is also a possible link between sleep apnea and sudden infant death syndrome, though it is debated.

Objectives of this project is

1. Made Cost effective device
2. Device which is easily available
3. Device which is easily operable

## III. LITERATURE SURVEY:

Obstructive Sleep Apnea Syndrome (OSAS). "Med Oral Patol Oral Cir Bucal". 2012 Nov; 17(6): e925–e929. Published online 2012 May 1. Continuous positive airway pressure (CPAP) is a form of positive airway pressure ventilator, which applies mild air pressure on a continuous basis to keep the airways continuously open in people who are able to breathe spontaneously on their own. It is an alternative to positive end-expiratory pressure (PEEP). Studies have shown nasal CPAP reduces ventilator time, but an increased occurrence of pneumothorax was also prevalent. CPAP failure rate is around 43%. No communication system to device. Uncomfortable during sleeps. An "APNEA DETECTOR" is a solution which can be used by the person during sleep and which can also contact the nearest hospital.

## IV. METHODOLOGY:

This project mainly consists of two sensors: heartbeat sensor and strain gauge. The heartbeat sensor is LDR based. Flex sensor reads the tension in the wire which works on the principle of resistance.

The project consists of an Arduino and android device. Arduino is interfaced with

an android device. The Arduino sends data to the android device.

The android application is fed with the ideal readings of the heartbeat sensor and flex sensor. The ideal heartrate of individual is different. While the expansion and contraction of chest of every individual is different. Initially the range is calibrated for every individual. The device reads the data at real time.

The condition for apnea is

1. High heart rate
2. No expansion and contraction of chest

When the above conditions are satisfied, the android device raises the alarm. Here alarm means, the android device will send the emergency situation to nearest hospital and an emergency contact number. Till the ambulance arrives the relative which emergency contact fed in the application would be available for the help of quick service.

## V. CONCLUSION AND FEATURE SCOPE:

- An "APNEA DETECTOR" is a solution which can be used by the person during sleep and which can also contact the nearest hospital during emergency.
- Since it will be cheap, it is affordable to every person who just thinks several times to spend money on health.

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